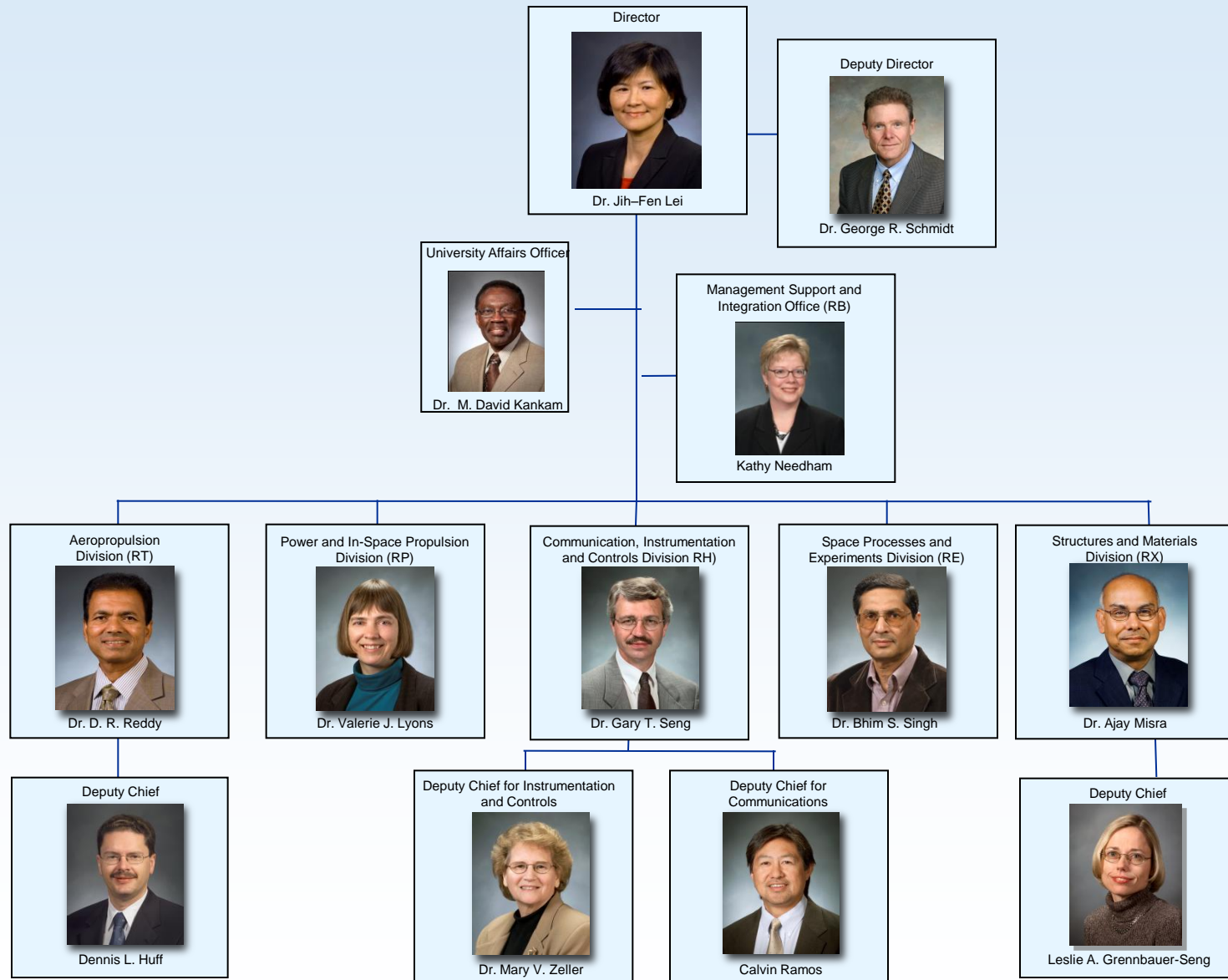
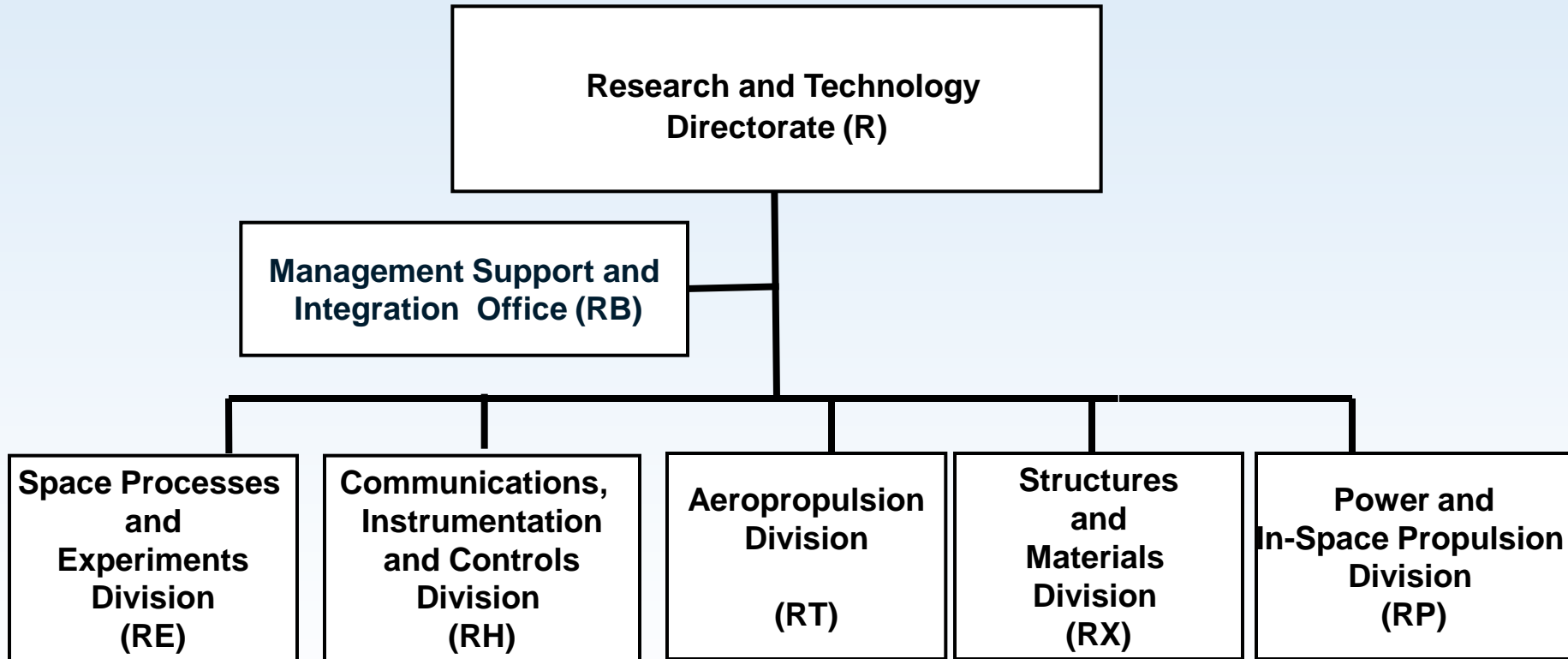


# Research and Technology Directorate Leadership Team



## Research and Technology Directorate (Code R)



## **University Affairs Officer - GRC**

**Dr. M. David Kankam**

*Phone: (216) 433-6143      FAX: (216) 433-3687*

*Email: [Mark.D.Kankam@nasa.gov](mailto:Mark.D.Kankam@nasa.gov)*

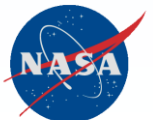
### **SCOPE OF WORK**

#### **Mission:**

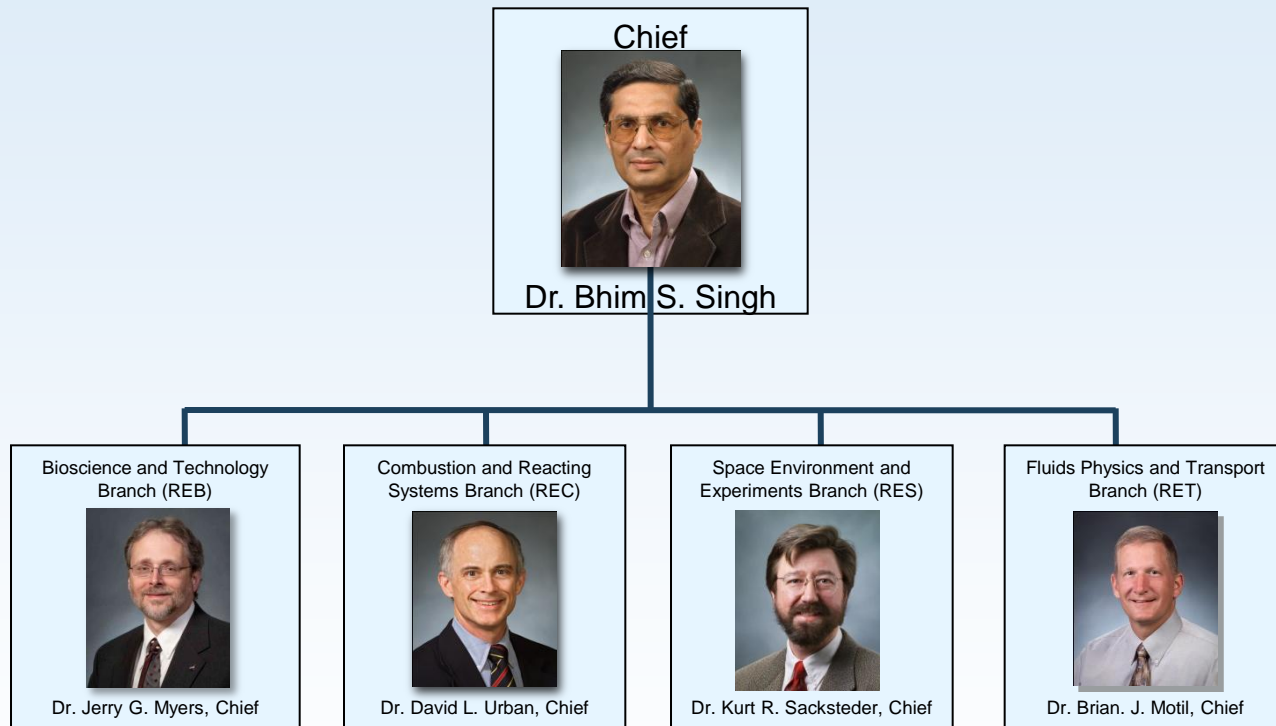
- **Assist the Glenn Research community collaborate with academe.**
- **Support the development of successor generations of scientists and engineers.**
- **Promote infusion of NASA mission content in classroom teaching, to develop STEM US workforce**
- **Develop/strengthen GRC-Space Grant partnership, for mutual benefits**

### **PROGRAMS**

- **NASA Postdoctoral Program (NPP)**
- **NASA Faculty Awards for Research (FAR) \*\***
- **NASA Glenn Faculty Fellowship Program (NGFFP)**
- **NASA ESMD Faculty Fellowship Program – via SGC \*\***
- **NASA Space Grant Collaboration-Experimental Prog. to Stimulate Competitive Research (EPSCoR) – via SGC**
- **NASA Undergraduate Student Research Program (USRP)**
- **NASA ESMD Student Internship Prog. \*\***
- **NASA ARMD Fundamental Aeronautics Prog. Internship**
- **NASA ARMD Student Contest Internship Prog.**
- **NASA Science & Technology Institute**
- **NASA Graduate Student Researchers Program (GSRP)**
- **NASA Space & Aeronautics Academies**



# Space Processes and Experiments Division (RE)



## Space Processes & Experiments Division

### Dr. Bhim Singh, Chief

Sandra Clay, Management Support Assistant

Phone: (216) 433-5396

FAX: (216) 433-8050

Email: [bhim.s.singh@nasa.gov](mailto:bhim.s.singh@nasa.gov)

RE

MS 77-5

### Bioscience & Technology Branch

#### Dr. Jerry G. Myers, Jr. Chief

Phone: (216) 433-2864

FAX: (216) 433-8050

Email: [jerry.g.myers@nasa.gov](mailto:jerry.g.myers@nasa.gov)

REB

110-3

### Combustion & Reacting Systems Branch

#### Dr. David Urban Chief

Phone: (216) 433-2835

FAX: (216) 433-8050

Email: [david.l.urban@nasa.gov](mailto:david.l.urban@nasa.gov)

REC

77-5

### Space Environment & Experiments Branch

#### Dr. Kurt Sacksteder Chief

Phone: (216) 433-2857

FAX: (216) 433-2221

Email: [kurt.sacksteder@nasa.gov](mailto:kurt.sacksteder@nasa.gov)

RES

309-2

### Fluid Physics & Transport Branch

#### Dr. Brian J. Motil Chief

Phone: (216) 433-6617

FAX: (216) 433-8050

Email: [brian.j.motil@nasa.gov](mailto:brian.j.motil@nasa.gov)

RET

77-5

- Biological systems research including human systems
- Novel noninvasive optical probes for interrogating biological & physical systems
- Computational & analytical modeling to enhance understanding of space physiology and medical risk
- Development and analysis of biochemical processes to enhance alternative fuels and ISRU applications

- Fire prevention, detection and suppression in exploration environments
- Material flammability in reduced-gravity under a range of O<sub>2</sub>/N<sub>2</sub> concentrations
- Sensors for fire detection & environment monitoring
- Analysis & design of thermo-chemical processes for ISRU applications

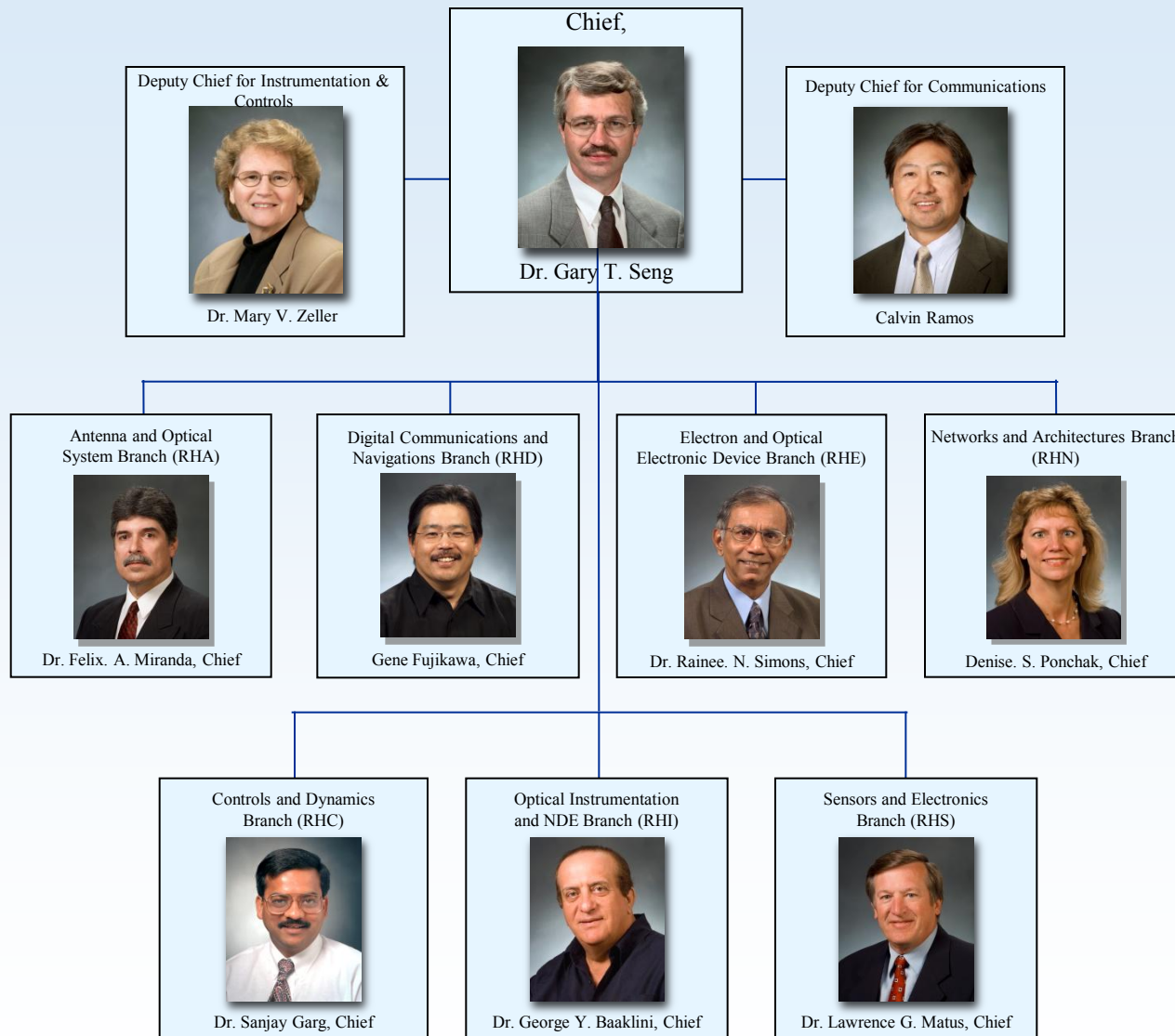
- Space Environmental Effects Testing & Modeling
- Lunar & Planetary Dust Characterization & Mitigation
- Extreme Temp. Electronics
- Space Radiators, Thermal Control Coatings/Management
- Protective Coatings, Surface Modification & Texturing
- Intercalated Graphite EMI Shielding
- Solar Thermal Systems for ISRU Applications

- Analytical & computational modeling of multiphase systems in variable gravity
- Advanced thermal control for spacecraft using multiphase technologies
- Liquid inventory management & phase separation tech. for low-gravity environments
- Dust filtration for sub atmospheric conditions
- Granular Flow and Excavation

Research and Technology Development Leadership Enabled Through Design, Development, and Investigation of Space Flight Experiments

Green Research Center at Lewis Field

# Communications, Instrumentation and Controls Division (RH)



## Communications, Instrumentation and Controls (RH)

Division Chief: Dr. Gary T. Seng (216) 433-3732 [Gary.T.Seng@nasa.gov](mailto:Gary.T.Seng@nasa.gov)  
Deputy for Communications: Mr. Calvin Ramos (216) 433-9391 [Calvin.T.Ramos@nasa.gov](mailto:Calvin.T.Ramos@nasa.gov)  
Deputy for Instrumentation and Controls: Dr. Mary V. Zeller (216) 433-6328 [Mary.V.Zeller@nasa.gov](mailto:Mary.V.Zeller@nasa.gov)  
Division Secretary: Ms. Valerie Daniel (216) 433-2327  
FAX: Comm-54 (216) 433-8705 / I&C-77 (216) 433-8990

### Antenna and Optical Systems Branch (RHA)

Dr. Félix A. Miranda  
Phone: (216) 433-6589  
[Felix.M.Miranda@nasa.gov](mailto:Felix.M.Miranda@nasa.gov)

Antenna Components & Systems  
Microwave Components & Systems  
Cryoelectronics  
RF and Optical Propagation  
Antenna Metrology  
Nanoantennas & Nanoelectronics

### Controls and Dynamics Branch (RHC)

Dr. Sanjay Garg  
Phone: (216) 433-2685  
[Sanjay.Garg@nasa.gov](mailto:Sanjay.Garg@nasa.gov)

Intelligent Engine Controls  
Active Engine Component Controls  
Engine Gas Path Diagnostics  
Propulsion Health Management  
Propulsion System Dynamic  
Modeling and Simulation  
Advanced Engine Control Concepts  
Cooperative Control of Mobile Robots

### Digital Communications and Navigation Branch (RHD)

Mr. Gene Fujikawa  
Phone: (216) 433-3495  
[Gene.Fujikawa@nasa.gov](mailto:Gene.Fujikawa@nasa.gov)

Software Defined Radios  
Advanced Navigation Technology  
EVA Radio Development  
Surface Wireless Communications  
Integrated Audio Technology  
Model-Based Signal Processing

### Electron and Opto-Electronic Devices Branch (RHE)

Dr. Rainee N. Simons  
Phone: (216) 433-3462  
[Rainee.N.Simons@nasa.gov](mailto:Rainee.N.Simons@nasa.gov)

High Power Traveling Wave Tube  
Solid State Power Amplifiers/  
Microwave and Wireless  
Components and Circuits  
3-D Electromagnetic Modeling  
Materials for Semiconductors and  
Vacuum Electronic Devices  
Radiofrequency Photonics

### Optical Instrumentation and NDE Branch (RHI)

Dr. George Y. Baaklini  
Phone: (216) 433-6016  
[George.Y.Baaklini@nasa.gov](mailto:George.Y.Baaklini@nasa.gov)

Optical Flow Measurements  
Optical Surface Measurements  
Propulsion Health Monitoring &  
Physics-based Modeling  
NDE Methods Development  
Flight Electronics Development  
Robotics Technology Development  
Photonics Research

### Networks and Architectures Branch (RHN)

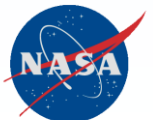
Ms. Denise S. Ponchak  
Phone: (216) 433-3465  
[Denise.S.Ponchak@nasa.gov](mailto:Denise.S.Ponchak@nasa.gov)

Network Technology  
Aeronautical Communication Systems  
Space Communication Architectures  
Communication Network Architectures  
Network-Centric Operations  
Simulation and Modeling

### Sensors and Electronics Branch (RHS)

Dr. Lawrence G. Matus  
Phone: (216) 433-3650  
[Lawrence.G.Matus@nasa.gov](mailto:Lawrence.G.Matus@nasa.gov)

Harsh Environment, Smart Sensor, Actuator and  
Electronic Technologies  
Silicon Carbide Sensors, Electronics and  
Crystal Growth  
Chemical Gas Sensors  
Thin Film Physical Sensors  
Micro-Electro-Mechanical Systems  
Nano-Electro-Mechanical Systems



# Power and In-Space Propulsion Division Managers (RP)

Division Chief



Dr. Valerie J. Lyons

Electrochemistry  
Branch (RPC)



Michelle A. Manzo,  
Chief

Propulsion and  
Propellants  
Branch (RPP)



Michael L. Meyer  
Chief

Thermal Energy  
Conversion Branch  
(RPT)



Richard K. Shaltens  
Chief

Photovoltaics and Power  
Technologies Branch  
(RPV)



Michael F. Piszczor,  
Chief



RPV 302-1

**Photovoltaic & Power Technologies Branch**

**M. F. Piszczor**  
*Chief*

Phone: (216) 433-2237  
FAX: (216) 433-6106  
Email: Michael.F.Piszczor@nasa.gov

- High Efficiency Solar Cells on Optimum Substrates
- Extended Temperature Solar Cells
- Quantum Dot Solar Cell
- Advanced Thin Film Solar Cell
- Solar Cell Measurement and Calibration
- Advanced Solar Blanket & Array Technology
- Space Power Arcing, Radiation and Charging (SPARC)
- Thermophotovoltaic (TPV)
- Integrated Solar Array/Antenna

RP MS 301-3

**POWER & IN SPACE PROPULSION DIVISION**

**V. J. Lyons, Chief**  
Phone: (216) 433-5970  
Email: [vyons@nasa.gov](mailto:vyons@nasa.gov)

**M. J. Patterson, Propulsion Senior Technologist**  
Phone: (216) 977-7481  
Email: [Michael.J.Patterson@nasa.gov](mailto:Michael.J.Patterson@nasa.gov)  
FAX: (216) 433-2306

RPC 309-1

**Electrochemistry Branch**

**M. A. Manzo**  
*Chief*

Phone: (216) 433-5261  
FAX: (216) 433-6160  
Email: Michelle.A.Manzo@nasa.gov

- Lithium Based Battery Technology
- Aerospace Flight Battery Systems
- Proton Exchange Membrane Fuel Cell and Electrolysis Systems
- Regenerative Fuel Cell Systems Technology
- Solid Oxide Fuel Cell Systems
- Modeling and Power System Analysis Codes

RPT 301-2

**Thermal Energy Conversion Branch**

**R. K. Shaltens**  
*Chief*

Phone: (216) 433-6138  
FAX: (216) 433-6133  
Email: Richard.K.Shaltens@nasa.gov

- Thermal Energy Conversion – Brayton, Stirling and Rankine Systems
- Electrical controllers and power management and distribution
- Fission Power Generation using reactors & isotope heat sources (partner w/DOE)
- Component development: organics, alternators, Heat exchangers, radiator systems, composites, magnets, etc.
- End-to-end system reliability and endurance testing
- Modeling, conceptual design and system performance modeling

RPP 301-3

**Propulsion and Propellants Branch**

**M. L. Meyer**  
*Chief*

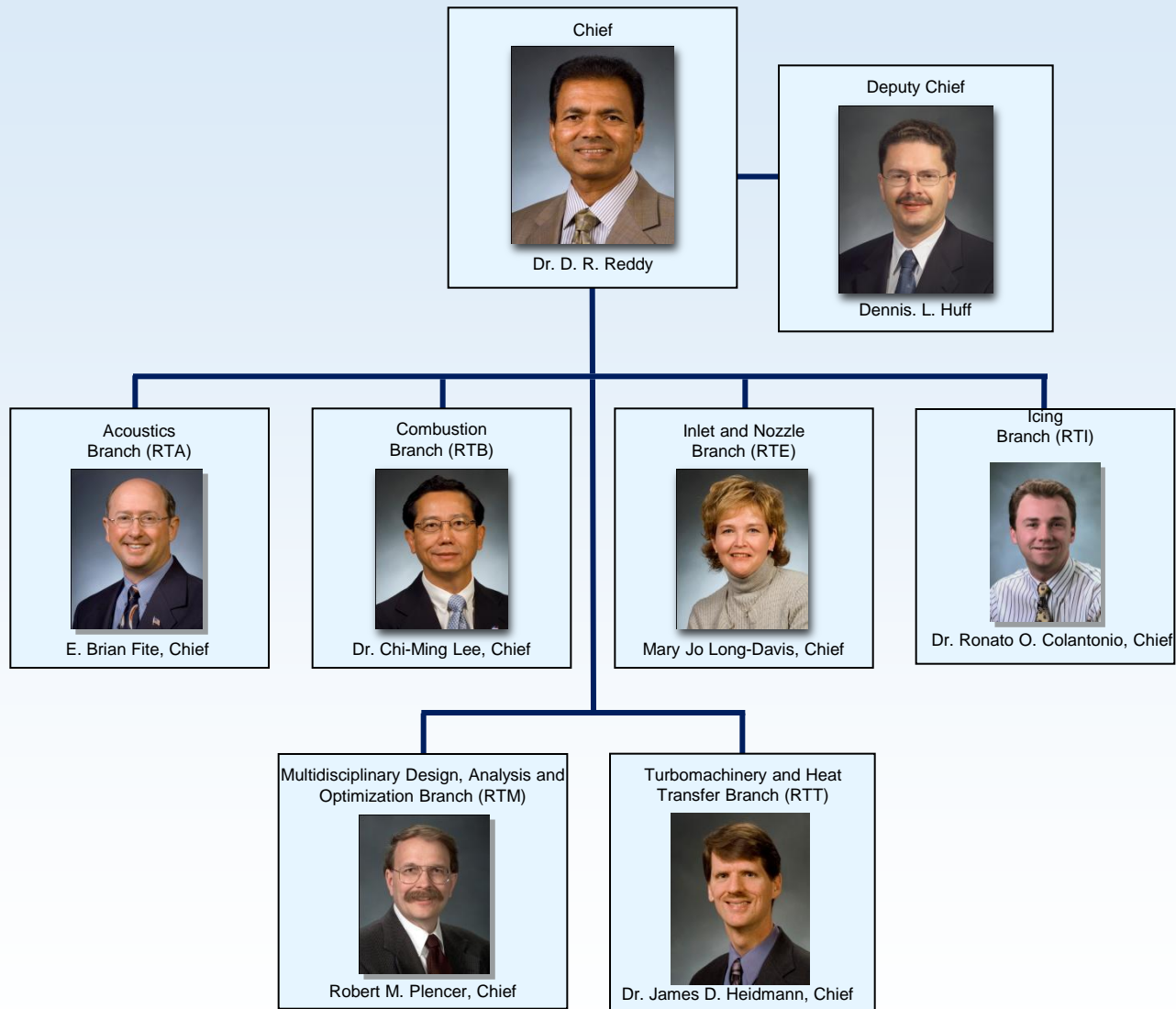
Phone: (216) 977-7492  
FAX: (216) 433-2306  
Email: Michael.L.Meyer@nasa.gov

- Electric Propulsion
- Ion thrusters, Hall thrusters, Power electronics
- System integration, qualification, and acceptance testing
- Capability to fabricate laboratory and flight hardware

- Advanced Chemical Propulsion
- Reliable ignition, combustion performance & stability, combustor cooling & materials, advanced propellants
- Main & reaction control propulsion

- Propellant Systems
- Long duration cryogenic storage, low-gravity propellant management, fluid distribution and transfer

# Aeropropulsion Division (RT)



# AEROPROPULSION DIVISION

**D. R. Reddy, Chief**  
**D. L. Huff, Deputy Chief**

## Acoustics Branch - RTA

*E. B. Fite*  
*Chief*

- Engine Noise Reduction Concepts
- Acoustic Source Identification Methods
- Advanced Noise & Flow Measurement Methods
- Computational Methods & Noise prediction
- Noise Suppression

## Combustion Branch - RTB

*C. M. Lee*  
*Chief*

- Sprays
- Combustion Diagnostics
- Ignition
- Combustion Stability
- Emissions
- Fuel Characterization
- Chemical Kinetics
- Design/Analysis Codes
- Alternative Fuels

## Inlet & Nozzle Branch - RTE

*M. J. Long-Davis*  
*Chief*

- Active and Passive BLC
- Specific Flow Phenomena
- CFD Applications
- Unsteady Aerodynamics
- Stability and Control
- Enhanced Mixing & Shear Layer Stability
- Fluidics & Thrust Vectoring
- Hypersonic propulsion

## Icing Branch - RTI

*R. O. Colantonio*  
*Chief*

- Propulsion Icing
- Protection/Detection
- Accretion Physics Modeling
- Flight Testing
- CFD Applications
- Aircraft Icing Effects

## MDAO Branch - RTM

*R. M. Plencner*  
*Chief*

- Advanced Multi-Disciplinary Analysis
- Systems Analysis
- Reduced Order Model Integration
- Software/Framework Definition
- Advanced Concepts & Evaluation

## Focus Groups

*Hypersonics – C. J. Trefny*  
*MDAO – M. S. Liou*  
*(Others TBD)*

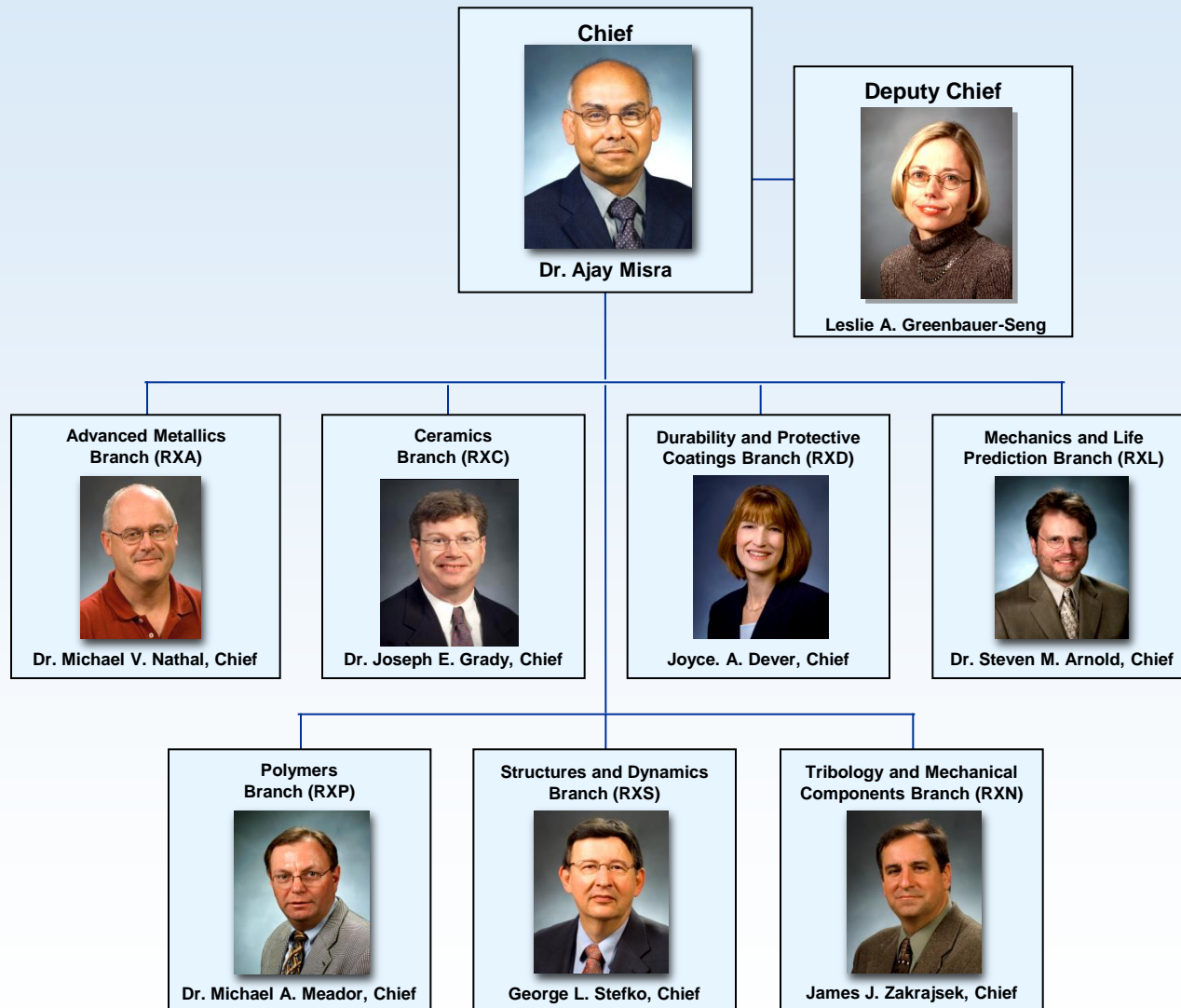
- Coordinate & Integrate Aeropropulsion Research
- Facilitate Technology Working Groups
- Interface with other Orgs.

## Turbomachinery & Heat Transfer Branch - RTT

*J. D. Heidmann*  
*Chief*

- Performance Improvement
- Multi-Stage Flow Physics
- Highly-Loaded Turbomachinery
- Transition & Loss Mechanisms
- Unsteady Aerodynamics
- Turbine Cooling & Heat Transfer
- Advanced Measurements
- High-Fidelity Analyses

# Structures and Materials Division (RX)



# Structures and Materials Division

## Division Office (RX)

*Chief: Dr. Ajay Misra*

*Deputy: Ms. Leslie A. Greenbauer-Seng*

**Senior Technologist:** Dr. James A. DiCarlo,  
Dr. James L. Smialek, Dr. Bruce M. Steinetz

### Advanced Metallics Branch (RXA)

*Chief: Dr. Michael V. Nathal*

- Alloy Development and Processing
- Microstructure - Property Relationships
- Materials Application Engineering

### Ceramics Branch (RXC)

*Chief: Dr. Joseph Grady*

- Structural Ceramics and Composites
- Solid Oxide Fuel Cells and Electrolysis Membranes
- Functional Ceramics

### Polymers Branch (RXP)

*Chief: Dr. Michael A. Meador*

- Polymer Matrix Composite
- Nanostructured Materials
- Functional Polymers

### Durability and Protective Coatings Branch (RXD)

*Chief: Ms. Joyce Dever*

- Protective Coatings
- Environmental Durability/Life of Materials
- High Temperature Chemical Behavior of Materials

### Tribology and Mechanical Components Branch (RXM)

*Chief: Mr. James J. Zakrajsek*  
*Deputy: Dr. Phil Abel*

- Drive System and Mechanisms
- Seals
- Terramechanics
- Oil – Free Turbomachinery
- Extreme Environment Tribology
- Surface Science

### Mechanics and Life Prediction Branch (RXL)

*Chief: Dr. Steven M. Arnold*

- Analytical and Computational Mechanics of Materials
- Experimental Mechanics
- Life Prediction

### Structures and Dynamics Branch (RXS)

*Chief: Mr. George L. Steffen*

- Dynamic Systems
- Aeroelasticity and Active Structures
- Components and Large Structures